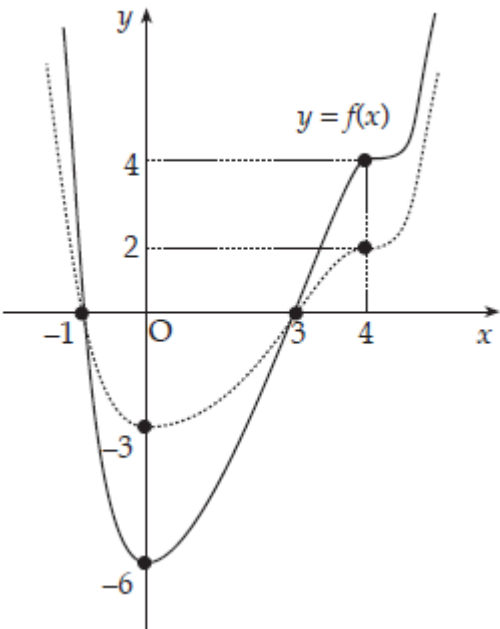
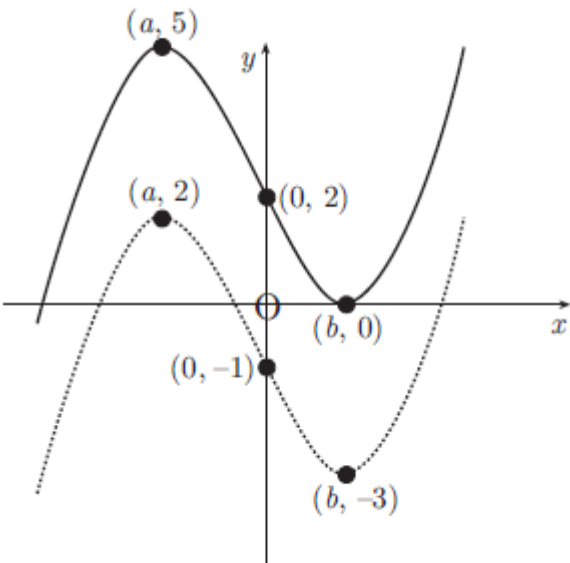
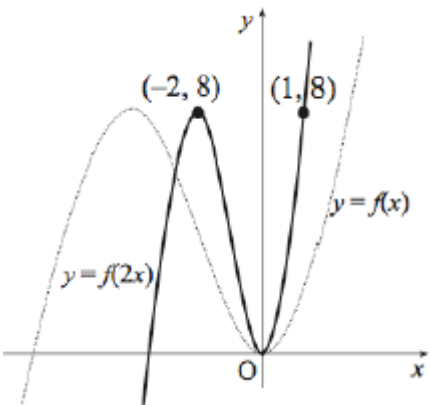
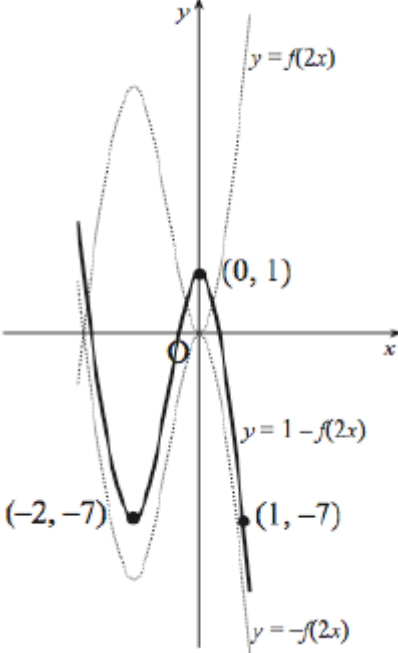


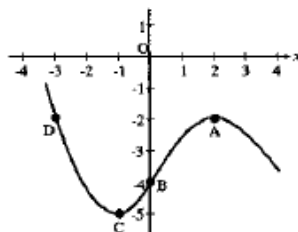
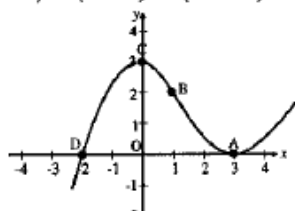
03 P2	<p><b>2C, 2C</b></p>  <ul style="list-style-type: none"> <li>•<sup>1</sup> refl. in <math>y</math> – axis &amp; <math>(0, -3)</math></li> <li>•<sup>2</sup> annotate <math>(4, 2), (3, 0), (-1, 0)</math></li> <li>•<sup>3</sup> a scaling &amp; <math>(3, 0), (-1, 0)</math></li> <li>•<sup>4</sup> annotate <math>(0, -6), (4, 4)</math></li> </ul>
04 P1	<ul style="list-style-type: none"> <li>•<sup>1</sup> reflection in <math>x</math>-axis and any one from <math>(0, -1), (a, 2), (b, -3)</math> clearly annotated</li> <li>•<sup>2</sup> the remaining two from the above list</li> <li>•<sup>3</sup> translation and any one from <math>(0, 2), (a, 5), (b, 0)</math> clearly annotated</li> <li>•<sup>4</sup> the remaining two from the above list</li> </ul> 
06 P2	<p><b>2C, 2C</b></p> <ul style="list-style-type: none"> <li>•<sup>1</sup> translate 4 units right and annotate one point</li> <li>•<sup>2</sup> annotate the other point <math>[P'(5, a) \ Q'(0, 5)]</math></li> </ul> <p style="text-align: right;"><b>2 marks</b></p> <ul style="list-style-type: none"> <li>•<sup>3</sup> translate <math>(a)</math> 2 units up and annotate one point</li> <li>•<sup>4</sup> annotate the other point <math>[P''(5, a + 2) \ Q''(0, 7)]</math></li> </ul> <p style="text-align: right;"><b>2 marks</b></p> <p><b>OR</b></p>

	<ul style="list-style-type: none"> <li>•<sup>1</sup> translate 4 units right and annotate one point</li> <li>•<sup>2</sup> annotate the other point <math>[P'(5, a) \ Q'(0, 5)]</math></li> <li>•<sup>3</sup> translate original <math>\begin{pmatrix} 4 \\ 2 \end{pmatrix}</math> and annotate one point</li> <li>•<sup>4</sup> annotate the other point <math>[P''(5, a + 2) \ Q''(0, 7)]</math></li> </ul>
09 P1	<p><b>2B, 3B</b></p> <p>3 points : the origin, (1, 8) and (-2, 8)</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> sketch and 1 point correct</li> <li>•<sup>2</sup> other two points correct</li> <li>•<sup>3</sup> reflect in <math>x</math>-axis, then vertical trans. s / i by •<sup>4</sup></li> </ul> <p>final points : (0, 1), (1, -7) and (-2, -7)</p> <ul style="list-style-type: none"> <li>•<sup>4</sup> sketch and 1 final point correct</li> <li>•<sup>5</sup> the other two final points correct</li> </ul> <div style="display: flex; justify-content: space-around; align-items: flex-end;">   </div>

### ANSWERS Pre 2000 Questions - Graphs of Related Functions

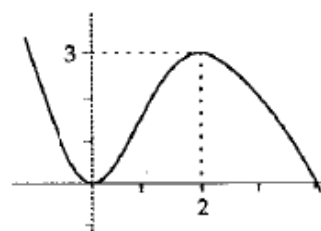
1	<ul style="list-style-type: none"> <li>•<sup>1</sup> translation of <math>\begin{pmatrix} 1 \\ 0 \end{pmatrix}</math></li> <li>•<sup>2</sup> <math>A(3, 0) \ B(1, 2) \ C(0, 3) \ D(-2, 0)</math></li> <li>•<sup>3</sup> reflect in <math>x</math> - axis</li> <li>•<sup>4</sup> translation of <math>\begin{pmatrix} 0 \\ -2 \end{pmatrix}</math></li> </ul>
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- <sup>5</sup>  $A(2, -2)$   $B(0, -4)$   $C(-1, -5)$   $D(-3, -2)$



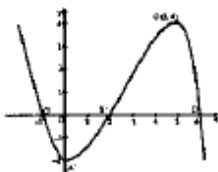
2

- <sup>1</sup> reflection in Ox
- <sup>2</sup> translation  $\begin{pmatrix} 0 \\ 2 \end{pmatrix}$
- <sup>3</sup> two trans. in correct order, annotate diagram

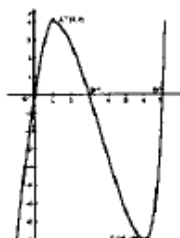


3

- <sup>1</sup> translation of  $\begin{pmatrix} -1 \\ 0 \end{pmatrix}$
- <sup>2</sup> positions of images of A, B, C, D, O clear from the sketch



- <sup>3</sup> reflect in x - axis
- <sup>4</sup> double y - coordinates
- <sup>5</sup> positions of images of A, B, C, D, O clear from the sketch



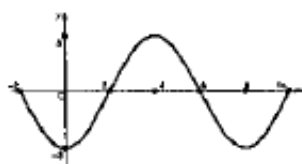
4

- <sup>1</sup>  $-2 \leq x \leq 2$
- <sup>2</sup>  $-4 \dots\dots$
- <sup>3</sup>  $\dots\dots 2$
- <sup>4</sup>  $-4 < x < 2$

5

- <sup>1</sup> for any two from list
- <sup>2</sup> for the other two

- correct shape and range
- zeros at 6 and 10
- minimum at (8, -3)
- annotation



- <sup>3</sup> for any two from list

- <sup>4</sup> for the other two

- correct shape and range
- zeros at 2 and 6
- extremes at (0, 6), (8, 6), (4, -6)
- annotation

